

Women in High Tech Jobs

Why is there so much excitement about “high-tech” in today’s economy?

Over the past decade, high-tech jobs have shown substantial growth. Women, therefore, need to recognize that in addition to paying well, these jobs are key in the changing economy of the 21st Century and should receive serious consideration as career choices. Projections for future growth indicate that computers, software, and applications for information technology will continue to have a substantial impact on lives and employment opportunities in the United States.

Use of the Internet and wireless technologies has exploded, creating phenomenal growth and new challenges for manufacturers of this equipment. “High-tech,” however, goes beyond computers, software, and the Internet. A broad spectrum of industries and occupations is considered “high-tech.”

What does “high-tech” or “high-technology” mean in the United States today? The term “high-tech” is used today to describe industries, occupations and products in which cutting-edge, state-of-the-art technologies are used. The technologies shape the design, development, and introduction of new products and innovative production processes. As high-technology firms systematically apply scientific and technical knowledge to problem solving, they conduct a substantial amount of research and development. Therefore, many of their employees have a scientific, technical or an engineering background.

In the June 1999 issue of the Monthly Labor Review, the Bureau of Labor Statistics (BLS) described “high-technology” occupations as scientific, technical, and engineering occupations, such as: engineers; life and physical scientists; mathematical specialists; engineering and science technicians; computer specialists; and engineering, scientific, and computer managers. Individuals employed in these occupations are collectively referred to as technology-oriented workers. Workers in these occupations need in-depth knowledge of the theories and principles of science, engineering, and mathematics, acquired through post-secondary specialized education ranging from an associate degree to a doctorate.

In addition to the occupations defined as high-tech, there are also high-tech aspects of many other occupations. For example, many workers operate and repair the products used in high-tech industries. These include computer and office machine repairers, aircraft pilots, and radiological technologists and technicians. Most of these occupations require an associate degree or higher. For some, however, certification by hardware and software producers acts as a substitute for formal academic education.

Estimates for the year 2006, developed by BLS, project that high technology employment will reach 21.5 million workers—roughly 16 percent of the 136 million total persons employed in non-farm wage and salary jobs. High-tech occupations offer high pay. In 2001 median weekly earnings for workers in technology-oriented occupations ranged between (\$713-\$1,174), which was more than the median for all occupations (\$597).

Between the 2000-2010 period, the number of computer specialists is projected to increase by more than two-thirds, adding nearly two million jobs, or nine percent of all projected growth during the period.

Source: Women’s Bureau, U.S. Department of Labor

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How great a disparity is there between the number of women and men employed in high-tech occupations?

Biological technicians and statisticians were the only two technology-oriented occupations in which more women were employed than men in 2001. According to 2001 Current Population Survey (CPS) data, one out of ten employed engineers was a woman, while two of ten employed engineering technologists and technicians were women. Among engineering specialties, industrial, chemical, and metallurgical/materials engineers were the only occupations in which women were more highly represented than the overall percent of total women engineers. Women made up 17 percent of all industrial engineers, 12 percent of metallurgical/metal engineers, and 11.5 percent of chemical engineers. Among all other engineering specialties - aerospace, mining, petroleum, nuclear, agricultural, civil, electrical or electronic, mechanical, marine, or naval architects - women represented fewer than 11 percent.

At the same time, three out of ten computer systems analysts, engineers, and scientists were women. In addition, one out of four computer programmers was a woman. Among natural scientists, women represented 51.6 percent of medical scientists and 44.4 percent of biological and life scientists, but accounted for a smaller portion of geologists and geodesists (24.0 percent), physicists and astronomers (7.7 percent).

What does the projected growth in high-tech occupations mean for women?

Between the 2000-2010 period, computer engineers are projected to have the fastest growth among all occupations - 664,000 such workers will be added, nearly doubling the 2000 figure. In addition, the number of computer scientists and systems analysts is expected to increase by nearly 60 percent (269,000 jobs). If women continue to make up three out of ten computer systems analysts and scientists, then an estimated 219,000 more women could be employed as computer software engineers, computer scientists and systems analysts by 2010. Computer support specialists are expected to increase by 97 percent, about 490,000 workers. If women are represented in computer support specialist jobs in the same proportion as among computer programmers, one out of four, then 122,000 more women may expect to be employed as computer support specialists by 2010.

What are the educational requirements for these high-tech careers?

Most high-tech careers, including computer engineers, computer systems analysts and scientists, computer programmers, engineers, natural and mathematical scientists, and managers in engineering, science and computer systems, generally require a bachelor's degree or higher, or work experience in addition to the degree requirements. Scientists are often required to have doctorate degrees because many of them work in basic research calling for extensive knowledge of their fields. Computer support occupations, science and engineering technologists and technicians usually require two years of specialized training, an associate degree, or certification.

Rapid changes in telecommunications, computers, and Internet technology have facilitated the acceptance of certification by software and hardware providers as meeting the educational and training requirements for some occupations. An estimated 2.4 million certifications had been awarded to roughly 1.6 million people worldwide by mid-2000. There are more than 350 different certifications offered by established vendors, such as Microsoft and Cisco, and by industry associations, such as the International Webmasters Association. In response to the rapid growth of these credentials, a Council on Computing Certification was formed in 2000 to develop guidelines for accreditation of the programs and examinations that lead to certification.

What can we conclude?

There was a growth surge in high-tech industries, occupations, and educational preparation for these occupations in the 1990's, and the future appears to hold opportunities for employment growth in the high-tech sector and among high-tech occupations. Employment of women has lagged in most of the high-tech occupations that show promise for future growth.

Software and hardware providers have gained acceptance as mechanisms for preparing high-technology workers for employment opportunities in the field. The challenges for women, then, are to find more pathways into high-tech occupations, and into opportunities in the new certification universe. They also need to take greater advantage of traditional educational opportunities and to enter high-tech occupations in greater numbers. The challenge for women is to explore educational and training opportunities that will lead them to high-tech careers.